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*Government
Forest Work
in Utah*



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GOVERNMENT FOREST WORK IN UTAH.

History.

TO THE people of Utah the rugged mountain ranges ever within their view mean much more than a wonderland of scenic beauty and grandeur; much more than a national playground and resort of rare distinction. Such values the natives of the State see and increasingly appreciate; but they also see in these towering hills the primary source of that productivity which, coupled with the ambitious industry of her citizens, has given Utah an enviable rank among the Western States.

Until about 20 years ago these great mountain areas were in danger of rapid devastation. The timbered slopes, the natural sources of supply of wood essential to continued civic progress, were afforded no protection against fire, reckless cutting, mismanagement, or wasteful exploitation. The vast areas of live-stock range were steadily being turned into dust beds through overintensive and uncontrolled grazing. In those days the traveler in the valley might have counted the herds upon the near-by mountain sides by the clouds of dust which rose above them. The future of irrigation and the continuance of pure and plentiful sup-

plies of water for domestic use were threatened through the destruction of the forest and vegetative cover on the mountain watersheds. Without the restraining influence of such a cover, early and disastrous spring floods, followed by extreme shortages of water during the dry summer months, were inevitable, with all their blighting effects upon agricultural development and upon community life and growth.

It was the recognition of this which led to the establishment of the 10 National Forests of Utah. These Forests now include the principal mountain ranges of the State—the Uinta in the northeastern part; the Wasatch range, running generally north and south down through the more isolated Elk Ridge, Abajo, and La Sal ranges in the southeastern part; the Pine Valley group in the southwest; and the Bear River and Raft River ranges in the northern part, extending on into Idaho. The National Forests in Utah include approximately 8,000,000 acres.

For a time the National Forest movement aroused strong opposition in most parts of the West. In 1891 Congress authorized the President to establish forest reserves, and the "Yellowstone Park Timberland Reserve" was created by President Harrison that same year. Portions of this old reserve are now embraced within the Targhee National Forest, in Idaho. Both President Harrison and President Cleveland proclaimed other reserves in the next few years until some 20,000,000

acres had thus been set aside from the public domain in the Western States. Then early in 1897 President Cleveland more than doubled their area in a day, and a storm of public disapproval followed.

This was not without reason. No provision whatever had then been made for administering the reserves or enabling the public to make use of their resources. Apparently great areas were to be withheld indefinitely from any form of development. Fortunately Congress, on June 4, 1897, enacted a law which gave the Secretary of the Interior the authority necessary to open them to all forms of legitimate use consistent with their primary purposes. These purposes were defined by the same law as the production of permanent supplies of timber for the use and necessities of citizens of the United States and the regulation of water flows. The National Forest system really dates from the passage of this act.

The first forest reserve embracing a large area in Utah was created in 1897 by President McKinley and was known as the Uinta Forest Reserve. During the next 10 years many additional areas in Utah were reserved. Since 1907 Utah's National Forest area has remained at about the same figure. Small areas found to be unsuited for forest purposes have been eliminated. On the other hand, the practical application, through twenty years, of the protective, administrative, and develop-

ment policies of the Federal Government within the National Forests has resulted in several supplemental proclamations based upon petitions from local residents placing comparable areas of new territory in the National Forest system.

Administration.

On February 1, 1905, the administration of the forest reserves was transferred from the Department of the Interior to the Department of Agriculture, where it now remains. The name of the bureau having immediate charge was changed from "Bureau of Forestry" to "Forest Service," and the term "Forest Reserves" was altered to "National Forests." The word "reserve" had become a misnomer, for the forests are not "reserved" or locked up, but are protected and administered in such a way as to secure the fullest possible utilization of their resources consistent with their conservation and improvement.

Gifford Pinchot became the first chief of the Forest Service (the Forester) under the Department of Agriculture. Under his leadership a firm and lasting foundation for the structure of forest administration was built up. He was succeeded in 1910 by Henry S. Graves, whose 10-year period of service as Forester not only brought marked progress in protective and administrative methods and in the general develop-

ment of the National Forest areas, but also placed the Forest Service and its policies in a position commanding the full support and confidence of the public. Early in 1920 Col. Graves was succeeded as Forester by Col. W. B. Greeley, who had risen through the ranks of the Forest Service to the position of Assistant Forester and had served as lieutenant colonel of the forestry regiments of the American Expeditionary Forces in France.

To bring the administration of the National Forests closer to the people directly served, on December 1, 1908, the forest units were grouped into six field administrative districts, with a district forester in charge of each. In 1916, following the purchase by the Government of forest areas in the East, a seventh field district was established, embracing forests in Arkansas, Florida, Oklahoma, South Carolina, North Carolina, Georgia, Tennessee, Virginia, West Virginia, New Hampshire and Porto Rico. The headquarters for this district, as well as the general headquarters of the Forest Service as a whole, is at Washington, D. C. Since 1920 the National Forests of Alaska have been administered as the eighth field district.

Utah's Forests in District 4.

The 10 National Forests of Utah, with 10 others in southern Idaho, 3 in Nevada, 3 in southwestern Wyoming, and the Kaibab, just north of

the Grand Canyon in Arizona, comprise what is known as the intermountain district, or district 4, of the Forest Service, and are under the jurisdiction of the district forester at Ogden.

Utah National Forests.

Forest.	Headquarters.	Net area.
		Acres.
Ashley ¹	Vernal, Utah.....	974,109
Cache ¹	Logan, Utah.....	276,737
Dixie ¹	Cedar City, Utah.....	435,106
Fillmore.....	Richfield, Utah.....	709,890
Fishlake.....	do.....	656,901
La Sal ¹	Moab, Utah.....	510,185
Manti.....	Ephraim, Utah.....	781,575
Minidoka ¹	Burley, Idaho.....	69,252
Powell.....	Widtsøe, Utah.....	683,580
Sevier.....	Cedar City and Widtsøe.....	720,235
Uinta.....	Provo, Utah.....	1,007,145
Wasatch.....	Salt Lake City, Utah.....	605,476
		7,421,191

¹ Forest is in more than one State. Only the Utah area is given in this table.

Forest Organization.

Each National Forest is in charge of forest supervisor, under the general direction of the district forester. To obtain information concerning any particular National Forest or to transact business with that forest, correspondence should be addressed to the forest supervisor; for instance:

FOREST SUPERVISOR,
CACHE NATIONAL FOREST,
LOGAN, UTAH.

If information is desired concerning the district as a whole, or all of the Forests of the State, or if the business involves more than one Forest, communications should be addressed to—

DISTRICT FORESTER,
FOREST SERVICE,
OGDEN, UTAH.

On Forests which have a particularly large volume of business the supervisor is assisted by a deputy, and sometimes by technically trained specialists in scientific forest or range management.

Every National Forest is divided into ranger districts, with a district ranger in charge of each. Under the supervisor, the forest ranger is responsible for the protection of his district and the administration of its affairs. The average ranger district embraces from 100,000 to 150,000 acres. The ranger supervises and directs the timber sales and the grazing, recreational, and other uses to which the area under his charge is put. He builds roads, trails, bridges, telephone lines, and other permanent improvements. During the long, dry summer he directs the fire-protection system on his district. A ranger must naturally be sound in body, for he is called upon to work during long periods at a strenuous rate in all kinds of weather. He must also know how to pack supplies and take care of himself and his horses in regions where he is thrown entirely upon his own resources.

Each summer temporary fire guards and men to assist in handling the intensive grazing use are employed.

In addition to the different classes of forest officers mentioned, logging engineers, lumbermen, scalers, and other specialists are employed where needed in conducting the varied lines of activity on the forests. In the district offices the district forester has administrative or executive assistants in charge of the major lines of work—grazing, forest management, lands, operation, research, engineering, and public relations. He has also

specialists and mechanical and clerical assistants as needed. A similar organization is found in the office of the Forester at Washington. On July 1, 1921, the force employed by the Forest Service numbered, approximately, 4,000. Of this number, 182 were employed in Utah on the forests and in the district offices at Ogden.

NATIONAL FOREST POLICY.

The Forests Are for Use.

The National Forests are administered to make them of the most use possible to the most people, but especially to the local farmer and settler. They are, first of all, to enable the citizens of the West to build and maintain homes. This policy was laid down by the Secretary of Agriculture in a letter to the Forester dated February 1, 1905, in which he said:

“In the administration of the National Forests it must be clearly borne in mind that all land is to be devoted to its most productive use for the permanent good of the whole people, and not for the temporary benefit of individuals or companies. All the resources of the National Forests are for use, and this must be brought about in a thoroughly prompt and businesslike manner under such restrictions only as will insure the per-

manence of these resources. You will see to it that the water, wood, and forage of the Forests are conserved and wisely used for the benefit of the home builder first of all, upon whom depends the best permanent use of lands and resources alike. * * * In the management of each Forest local questions will be decided upon local grounds; the dominant industry will be considered first, but with as little restriction to minor industries as may be possible. Sudden changes in industrial conditions will be avoided by gradual adjustment after due notice, and where conflicting interests must be reconciled the question will always be decided from the standpoint of the *greatest good to the greatest number* in the long run."

A brief statement of some of the principal activities within the National Forests of Utah will indicate how the above-stated policy is being carried out.

Agricultural Land.

At the time the National Forests were created, boundaries were drawn to exclude, so far as practicable, all land chiefly valuable for agriculture. It was impossible to exclude all such land, however, and the act of June 11, 1906, was passed to provide for entry and settlement of agricultural tracts within the forests. During the past few years all land within the National Forests of Utah has been classified after a care-

ful examination and survey by experts. As a result of this classification, the remaining agricultural area, which was very small, was listed for entry, and to-day there is very little land suitable for homesteading within the Forests which has not already been filed upon.

Under these provisions for settlement and entry, tracts embracing over 73,000 acres have been taken up as homes within the Utah Forests. The Forest Service is glad to have settlers in the forests. Not only are they of material help in fire protection and in many other ways, but they also make use of the resources and help build up the country.

Sale of Timber.

Ripe timber on the Forests, of which there is a large amount, is sold at a fair price to the highest bidder. Anybody may purchase timber, but no one can obtain a monopoly of it or hold it for speculative purposes. The fewest possible restrictions are imposed upon purchasers of timber, only such as will insure cut-over areas being left in the best condition for future growth. Experienced woodsmen estimate the quantity and quality of National Forest timber and its approximate value as a basis for the stumpage price to be charged. In fixing this price all factors which affect the cost of lumbering, such as the accessibility of the timber and the number and kinds of improvements necessary, as well as

the general market conditions, are taken into account. The prices asked allow the purchaser of National Forest timber opportunity for a fair profit. Attractive logging chances are gladly made known to the public, and full information regarding them and the conditions of sale is given to inquirers.

The trees to be cut on a sale are marked in advance by a forest officer, the object being to leave enough of the younger trees to form the basis of a second crop of timber on the same land. A limited number of mature seed-bearing trees also are left to effect natural reforestation should the younger growth be destroyed by fire, insects, or disease. This is merely applying the principles of practical forestry to make sure that there will always be timber on the National Forests to cut.

Timber on the watersheds of streams is never cut so extensively as to impair the protective cover that the Forest affords, because one of the chief objects of establishing and maintaining the National Forests is to regulate stream flow.

Small sales of timber are made by forest officers on the ground without delay. "Red-tape" methods are not permitted in National Forest timber sales, big or little. Larger sales are made either by the supervisor of the Forest, the district forester, or the Forester, according to the quantity of timber involved.

Small sales of timber for local use are encouraged. This is one of the ways in which the National Forests are made to serve the small lumberman and consumer. Though single sales have been made for as much as 100,000,000 board feet, over nine-tenths of all sales made are for less than \$100 worth of timber each. Sales are made to settlers and farmers at the actual cost of making the sales, without charge for the timber itself.

Utah is not a heavily timbered State. Nevertheless the 95 per cent of her timber which is found within the National Forests constitutes a resource of immense value, which will be increasingly drawn upon in the upbuilding of her industries and communities.

The native timber species of Utah are western yellow pine, Engelmann spruce, lodgepole pine, and Douglas fir, and the cordwood species are quaking aspen, juniper, and piñon pine. Between seven and eight billion feet of merchantable saw timber, railroad ties, and mine-prop material is available. In addition, there are vast tracts of aspen, which will some day supply pulp mills throughout this region.

Utah's heaviest bodies of timber are in the Uinta range, where there is estimated to be 3,000,000,000 feet of mature timber; on the Aquarius Plateau of the Powell Forest in the southern part, with a stand of a

billion and a quarter board feet; and on the watershed of the Sevier River, with a quarter-billion feet. The entire Wasatch range offers large quantities of merchantable timber and cordwood.

At present the few small mills in operation cut approximately \$30,000 worth of stumpage each year and supply less than one-tenth of the local demand for lumber. This is true simply because it has hitherto been possible to supply the Utah market from the highly developed lumber regions of the Pacific coast more advantageously than from the comparatively inaccessible and undeveloped native forests.

With the steady development of transportation facilities and the opening up of the local timbered regions there are presented increasingly excellent opportunities for a number of large local sawmills. The available timber resources and local market conditions are becoming more widely and favorably known, and the lumber industry must soon develop to a position of much greater importance among the industrial activities of Utah. Pulpwood possibilities are already being investigated with growing interest, and, as there is a vast supply of aspen available and suitable for the manufacture of paper pulp, the establishment of one or more large pulp mills in northern Utah can be only a question of time.

Free Use of Timber.

In addition to the timber sold under commercial and domestic-use sales, large quantities of dead and down timber and material suitable for fence posts and other purposes are removed from the National Forests each year under the regulations permitting the granting of this material free of charge, within limits, to local residents. Over 2,700 free-use permits were granted last year to people residing within or adjacent to the Utah Forests, involving the removal of approximately 8,000,000 board feet of material.

Mining.

Mineral deposits within National Forests are open to development exactly as on unreserved public land. A prospector may go anywhere he chooses and stake a claim wherever he finds any evidence of valuable minerals. The only restriction is that mining claims must be bona fide ones and not taken up for the purpose of acquiring valuable timber or a town or power site, or to monopolize the water supply on stock ranges. Bona fide mining men do not wish to take up claims for an unlawful purpose, and the National Forests are open to such operators at all times. Prospectors may obtain a certain amount of National Forest timber free of charge to be used in developing their claims, and in other ways the Forest Service gives the mining man all the help it can.

Grazing Use.

The grazing of live stock now constitutes one of the most important uses to which the National Forests of Utah are put. Annually these great forest ranges supply summer pasturage for nearly a quarter of a million cattle and horses and over a million head of sheep, owned by over nine thousand farmers, ranchers, and stockmen of the State. The apportionment of the range privileges among the different classes of stock, and their owners, on a fair and impartial basis; the supervision of the use of range; and the care and proper handling of the stock and its distribution over the forest areas constitute some of the greatest problems of National Forest administration. Nowhere else is the demand for forest range so intensive as in Utah. Nowhere else is there greater need for so administering forest ranges as to provide for the greatest possible numbers of stock and yet fully conserve the watershed values of the mountain slopes. Far below in the valleys lie the irrigated lands, the basis of the key industry of Utah. The farmer looks to the rugged hills for that ample and regular supply of water without which his efforts will avail him nothing, and he must not look in vain. Nor must any abuse be allowed which would impair in any degree the purity or the flow of these crystal mountain springs and streams which supply the domestic needs of the cities and towns.

The application of sound principles of range administration through a period of 20 years has clearly demonstrated the practicability of harmonizing the needs of the live-stock industry, the farm, and the municipality. Hitherto inaccessible range areas have been opened up through the development of watering places. A better distribution of the stock on the range is secured through better methods of salting and through the construction of the great range fences. Improved methods of handling the stock have been devised and brought into use. The elimination of poisonous plant species from the range progresses steadily. Grazing periods have been shortened where necessary to secure the best growth of the forage. Studies are continually being prosecuted with the object of developing better methods. The results are improved watershed and range conditions, assured stability to the business of the local live-stock growers, and greater production of meat and the by-products of the live-stock industry.

The stockmen themselves take a great interest in the management of the forest ranges. Over a hundred community live-stock associations have been organized within the State and are actively cooperating with the forest officers. These associations are very influential in bettering the grades of stock as well as the methods of marketing, herding, salt-

ing, and the general handling of the stock. Naturally, the Forest Service does everything it can to encourage the formation of such associations and to support them after organization.

The story of the old range wars is a closed chapter. The old and wasteful methods are being steadily discarded. In their place is growing the spirit of cooperation and open-mindedness toward new and improved methods and ideas. Utah's live-stock industry thrives without injury to the resources on which it so largely depends.

The Great Basin Forest Experiment Station.

Very soon after the forest ranges were placed under control it became apparent that to administer and develop them properly better knowledge of the range vegetation and the various factors, natural and artificial, that determine its character and quantity must be secured. From 1907 to 1913 a small force of investigators was steadily at work trying to cover the general field of range problems in an effort to assist forest officers and stockmen in solving their difficulties. In 1913, to provide for more accurate and intensive study of these problems, a forest-grazing experiment station was established. It was located in Utah because the climatic and vegetative conditions there are intermediate, as it were, between those of the Northwest and the Southwest. The locality selected

was on the Manti forest. The station, known as the Great Basin Forest Experiment Station, is at an elevation of 9,000 feet, in the heart of the cattle and sheep range of Utah.

Some of the more important problems under investigation are: Practical methods of restoring and maintaining the grazing capacity of the range under the various conditions of climate, soil, and grazing practice; determination of the grazing capacity of various forage types, brush areas included; means of recognizing overgrazing in its early stages and means of correcting this evil; control and prevention of erosion of Forest ranges; effect of grazing of the various classes of stock on timber reproduction; and methods of eradicating poisonous plants.

Over a quarter of a century ago most of the public-domain land included in the high, cool, summer range which is now within the National Forests was cropped so far beyond its capacity and the stock came off in such poor condition of flesh that heavy winter losses occurred almost every year. Experiments proved that the removal of the forage crop year after year during the growing period weakens the plant greatly, delays the resumption of spring growth, postpones the period of seed maturity, and decreases the seed production as well as the fertility of the seed crop. It was found that by applying the deferred and rotation system these depleted lands can be revegetated

as rapidly as if complete rest were given. On a portion of the range grazing is deferred until after seed maturity by holding the stock on other portions during the early part of the season. When the first area is thoroughly reseeded a second area is treated in the same way, and so on over the whole of the depleted area. This method is now being applied with equally good results on practically all important grazing forests throughout the West.

Over 500 tests with cultivated plants have been made in the more important range types in order to find, if possible, grass or clover which would greatly increase the forage crop. Generally, however, these tests have been unsuccessful. The building up of the range is chiefly dependent upon the seed development of the native forage plants.

To stock a range properly it is necessary to know its forage resources and then make grazing tests in order to find out how much stock it will safely support year after year. At present the experiment station is investigating the grazing capacity of browse lands. This study may prove that areas of heavy browse should be grazed on the basis of the browse cover rather than on that of the grasses and weeds growing beneath the brush. Should this prove to be the case, the number of stock may be considerably increased in many localities.

It is important to be able to recognize and correct overgrazing in its early stages. On most summer ranges in Utah the wheat grasses constitute the highest and most important type of forage. If this cover is weakened by overgrazing, such plants as yellowbrush, lupine, mountain sunflower, and sneezeweed make their appearance. If overgrazing is continued, these perennial weeds are sooner or later replaced by useless annual plants. Finally even these give way, leaving the area denuded and subject to heavy soil leaching and erosion. By learning what plants come in as the desirable types of forage begin to give way it is possible to recognize overgrazing in its early stages, to apply remedial measures, and thus prevent continued range depletion.

Since one of the chief objects of the National Forests is to provide a continuous supply of timber, it is important so to manage grazing that it will interfere as little as possible with timber reproduction. Investigations show that injury to timber reproduction by grazing, regardless of the class of stock, varies with the intensity of the cropping. Generally, sheep and goats are more destructive to all kinds of timber reproduction than cattle and horses. It has been found that on cut-over aspen lands sheep and goats should be entirely excluded for at least three years, in order to give the young sprouts time to become well established and to extend the leaders beyond the height at which sheep

browse. On cattle range, light grazing is seldom injurious to the aspen sprouts. Where young conifer or evergreen seedlings are being established, light grazing and open herding are essential.

About 6,000 cattle and 16,000 sheep are lost annually on the National Forests from grazing on poisonous plants. Tall larkspur is responsible for about 90 per cent of the losses in cattle on the high range, and death camas is probably the cause of the heaviest losses in sheep. Experiments have shown that larkspur may be economically eradicated from the range either by cutting or grubbing. If the cutting method is used, the plants should be cut twice the first two seasons and once the third year for complete eradication. If grubbing is applied, the plants are at once destroyed, provided the roots are grubbed to a depth of 8 or 9 inches. Between 1915 and 1917 the Forest Service expended approximately \$11,000 in the eradication of tall larkspur by grubbing. It is estimated that cattle to the value of \$16,000 were saved in 1917 alone as a result of this work, and as a further result more than a quarter million acres of badly infested cattle range was made relatively safe for grazing use.

Other Forest Uses.

Many other minor uses of the forest resources are in effect under the Government policy of fullest possible utilization and development. Many special-use permits are issued on the Forests every year, some for which nominal charges are made and some entirely free. They cover the construction of reservoirs, ditches, conduits, private telephone lines, cabins, corrals, and pasture fences, the cutting of wild hay, and a wide variety of other desirable uses.

Water-power development is one of the most promising future uses of the forest resources. The swift mountain streams offer sufficient power to meet every need of the State's growing industrial activities, and under recent legislation great progress in power development is to be expected.

Municipal Water Supplies.

The municipal water supply of 65 cities and towns in Utah, including that of Salt Lake City, is taken directly from the protected National Forest watersheds. These municipal water systems supply a total population of nearly 225,000, using approximately 80,000,000 gallons of water daily. Approximately \$16,000,000 has been invested by these Utah communi-

ties to provide their citizens with an adequate supply of pure water. This situation serves to emphasize the vital relation between the effective protection of these forest watersheds and the daily welfare of the individual citizen.

Recreation.

The National Forests of Utah offer unexcelled opportunities for public recreation. No restrictions of any kind are placed upon the summer visitor to the Forests, except that fire precautions and sanitary requirements must be observed. He is free to come and go where he wishes, and may select his own camp site or use one of the increasing number of sites provided with camp conveniences by the Forest Service for public use. The Forests have everything the outdoor enthusiast could desire—scenic grandeur, a most healthful and invigorating summer climate, pure mountain water in abundance, fishing and hunting, mountain climbing—in short, every natural attraction. In addition, the growing system of National Forest roads, trails, and telephone lines and the courteous attention and help of the forest ranger and his assistants are all at the service of the visitor. Any forest supervisor will gladly furnish detailed information concerning the attractions and advantages of the Forest under his charge.

Fish and Game.

Not only are fish and game protected within the National Forests of Utah, but the State game department and the Forest Service are closely cooperating in systematically restocking streams in order to maintain and improve the fishing in the wonderful mountain streams of the State. Every forest officer is a deputy State game warden, fully empowered to enforce the State and Federal game laws. Sportsmen's associations are rapidly gaining in number and strength throughout the State, and are actively working with the State and forest officials for the improvement of fish and game conditions generally.

Improvement Work.

When the National Forests of Utah were established means of travel and communication within and adjacent to them were seriously lacking almost everywhere. In order that a system of fire protection might be worked out and applied, and in order that the hitherto inaccessible resources might be made available for proper utilization, it was necessary for the Forest Service to build roads, trails, and telephone lines. It was also necessary to select and improve administrative sites, to construct stations and facilities for its field force, and to increase the value and

utility of the live-stock ranges through the development of places for the watering of stock, through the construction of drift and division fences, and through many other range improvements. Much has been accomplished toward these ends; much more remains to be done, but the work is being steadily pushed onward as funds become available.

Fire Protection.

The fire menace on the Utah Forests was soon brought fairly well within control. Comparatively speaking, the natural fire hazard of these forests is not high. Climatic conditions, the rarity of dry electrical storms, the more or less open, broken stands of timber, and the well-watered slopes all contribute to this situation. The serious forest fires which in early years wrought destruction of immense values in the heavily timbered Uintas and the northern Wasatch Mountains were largely the result of human carelessness or the intentional but misguided use of fire by the early settler and the Indian for the purpose of clearing land or of driving game into the open, or in other pursuits within or near the timbered areas. These have been largely eliminated, although every year a number of serious fires still occur. Now, with the advent of thousands of recreation seekers annually, adequate protection is obtained only at the cost of eternal vigilance and thorough

going organization, together with intensive campaigns to impress the traveling public with the great necessity for the utmost care with fire in the woods.

Self-Sustaining.

Utah's National Forests are a self-sustaining business enterprise. Although they were not established for profit-paying purposes primarily, and are not administered with immediate profit as a prime objective, the receipt from the sale and use of their resources each year already exceed the cost of their protection and administration. Each year 25 per cent of the net receipts is returned to the State for road and school purposes. This annual return has grown from \$33,000 in 1909 to nearly \$65,500 in 1920.

Another 10 per cent of the forest receipts has been expended by the Forest Service each year since 1912 for road construction within the State. This 10 per cent fund, which amounted to \$13,500 in 1912, is now about double that sum.

Special legislation by Congress in and subsequent to 1916 has given a tremendous new impetus to road-building activities in Utah, as, indeed, it has throughout the entire West. The counties, the State, and the Federal Government are cooperating in the rapid extension of the

State highway system on an auto-travel basis. As a result the great natural resources of the region are rapidly becoming more and more accessible, more widely known and appreciated. More rapid development must follow as a natural result.

Investigative and Cooperative Work.

Besides administering the National Forests, the Forest Service conducts a number of special investigations. Those relating to range use have already been mentioned; others concern the growth and management of forests and their utilization. They include studies of the characteristics and growth requirements of the principal tree species in order to determine how different types of forest should be handled, and also the best methods of forest planting, both on the National Forests and elsewhere. Thus the scientific problems underlying the management of forests, the relation of forests to stream flow and climate, and the like are being worked out.

The Forest Service cooperates with States in studying their forest conditions in order to develop forest policies adapted to their needs. It assists private owners by furnishing advice concerning the best methods of managing and protecting their forest holdings. It also co-

operates with States, under the terms of section 2 of the Weeks law, in protecting from fire the forest cover on the watersheds of navigable streams.

One of the aims of forestry is to see that the products of the forest are put to their best use with the least waste. Through studies of the uses of wood the Forest Service aids the wood-consuming industries to find the most suitable raw material and to develop methods of utilizing their waste products. It also investigates methods of disposing of wood waste, collects statistics on the prices of lumber at the mill and on the market, and studies lumber specifications and grading rules.

At the Forest Products Laboratory, maintained at Madison, Wis., in cooperation with the University of Wisconsin, studies are made of the strength of wood and its other physical properties, its seasoning and kiln-drying qualities, its preservative treatment, its use for the production of paper pulp, fiber board, and the like, and its utilization in the manufacture of alcohol, turpentine, rosin, tar, and other chemical products.

Forest Officers and the Public.

You are cordially invited to consult the forest officer. You will find him willing to give you all the information and assistance he can. As

an agent of the people, he regards it as his plain duty to assist the public in making use of the Forest resources as well as to prevent misunderstanding and violation of the regulations. Forest users can aid greatly in the efficient performance of the public business by according to forest officers the same frankness and consideration which the forest officers are expected to show them.

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